



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/689,774	10/13/2000	Akio Katsube	018976-181	8104

21839 7590 05/29/2007
BUCHANAN, INGERSOLL & ROONEY PC
POST OFFICE BOX 1404
ALEXANDRIA, VA 22313-1404

EXAMINER

COZART, JERMIE E

ART UNIT	PAPER NUMBER
----------	--------------

3726

MAIL DATE	DELIVERY MODE
-----------	---------------

05/29/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/689,774

Applicant(s)

KATSUBE ET AL.

Examiner

Jermie Cozart

Art Unit

3726

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2007.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4, 7 and 9-14 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 7 and 9-14 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 7, 11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Best et al. (3,561,107).

Regarding **claim 7**, Best discloses manufacturing electronic parts by providing a holding jig (10) made of an elastic material (i.e. plastic; col. 2, lines 18-19), wherein at least one surface of the elastic material is adhesive (i.e. plastic is inherently adhesive depending on temperature or the chemical composition of the material being attached to the plastic), mounting a substrate (12, 14, 16) on the holding jig (10) by an adhesive strength of the surface of the elastic material, mounting an element (30) onto the substrate (12, 14, 16) and electrically connecting (col. 2, lines 27-35) the element (30) to the substrate (12, 14, 16) while the substrate is held on the surface of the elastic material, and inherently applying ultrasonic waves (via vibratory member 40; col. 2, lines 47-58) to a bonding portion at which the electric connection (col. 2, lines 27-35) is performed while the substrate (12, 14, 16) is held on the surface of the elastic material (10).

Art Unit: 3726

Regarding **claim 11**, the step of holding the substrate (12, 14, 16) includes using the holding jig which includes a laminate structure of a hard plate (i.e. anvil 38; col. 2, line 48) and the elastic material (10).

Regarding **claim 14**, the mounting process includes a bump bonding process (i.e. solid conductive members 32, 34, 36 serve as bumps which facilitate the bonding of the chip/element 30 to the substrate 12, 14, 16).

See column 2, lines 18-58, and figures 1-3 for further clarification.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 7, 11, and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Best et al. (3,561,107) in view of Weissenstern et al (3,255,511).

Regarding **claim 7**, Best discloses manufacturing electronic parts by providing a holding jig (10) made of an elastic material (i.e. plastic; col. 2, lines 18-19), wherein at least one surface of the elastic material is adhesive (i.e. plastic is inherently adhesive depending on temperature or the chemical composition of the material being attached to the plastic), mounting a substrate (12, 14, 16) on the holding jig (10) by an adhesive strength of the surface of the elastic material, mounting an element (30) onto the substrate (12, 14, 16) and electrically connecting (col. 2, lines 27-35) the element (30) to the substrate (12, 14, 16) while the substrate is held on the surface of the elastic

Art Unit: 3726

material, and applying vibratory energy [via vibratory member 40; col. 2, lines 47-58] to a bonding portion at which the electric connection (col. 2, lines 27-35) is performed while the substrate (12, 14, 16) is held on the surface of the elastic material (10).

Regarding claim 11, the step of holding the substrate (12, 14, 16) includes using the holding jig which includes a laminate structure of a hard plate (i.e. anvil 38; col. 2, line 48) and the elastic material (10).

Regarding claim 14, the mounting process includes a bump bonding process (i.e. solid conductive members 32, 34, 36 serve as bumps which facilitate the bonding of the chip/element 30 to the substrate 12, 14, 16).

See column 2, lines 18-58, and figures 1-3 for further clarification.

Best, however, does not explicitly disclose applying ultrasonic waves to the bonding portion.

Weissenstern discloses applying an ultrasonic transducer (21) to mount an element (16) to a substrate (11), wherein it is inherent that the ultrasonic transducer applies ultrasonic waves because the transducer converts electrical energy to very high frequency vibratory mechanical energy in the frequency range between 40 and 100 kc. per second such that a true metallurgical bond is formed between the thin metal films of the element and substrate. *See column 2, line 10 – column 3, line 46, and figure 4 for further clarification.*

Therefore, it would have been obvious to one having ordinary in the art at the time the invention was made to substitute the vibratory member of Best with an ultrasonic transducer that applies ultrasonic waves to a bonding portion, in light of the

Art Unit: 3726

teachings of Weissenstern, in order to create a true metallurgical between the contact portions of the element and substrate.

5. Claims 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Best/Weissenstern as applied to claim 7 above, and further in view of Oehmke (4,098,945).

Best/Weissenstern discloses all of the claimed subject matter except for the hardness of the elastic material having a rubber hardness degree of at least A30, the holding jig comprising heat-resistant material having a heat-resistance temperature of about 250°C, and the elastic material comprising silicone resin.

Oehmke discloses a conductive adhesive elastic material comprising an elastic binder for "peelable adhesive fastening of metallic materials without interruption of the electrical conductive pathways between them" (col. 7, lines 62-64). It is disclosed that the conductive material may preferably comprise silicone rubber (col. 6, lines 38-43). Furthermore, it is noted that the "binder should be capable of providing a soft composition having a Shore A hardness of less than about 40" (col. 6, lines 34-36). It is also pointed out that a Shore A hardness of greater than 40 is too hard for most applications (col. 1, line 66 – col. 2, line 1).

Regarding claim 9, it would have been obvious to one having ordinary skill in the art at the time of invention, to have provided the elastic of Best/Weissenstern with a rubber having a hardness of at least A30, in light of the teachings of Oehmke, in order to provide an adhesive having a requisite conformability, moldability, and flexibility (col. 2, lines 21 + of Oehmke).

Regarding claim 10, Applicant and Oehmke each disclose a Silicone rubber composition. Applicant notes that these composition are stable at 250 °C. "Products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding claim 12, in Oehmke the elastic material is an adhesive silicone rubber layer (col. 6, lines 38-43).

6. Claims 9, 10, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Best et al. in view Oehmke (4,098,945).

Best discloses all of the claimed subject matter except for the hardness of the elastic material having a rubber hardness degree of at least A30, the holding jig comprising heat-resistant material having a heat-resistance temperature of about 250°C, and the elastic material comprising silicone resin.

Oehmke discloses a conductive adhesive elastic material comprising an elastic binder for "peelable adhesive fastening of metallic materials without interruption of the electrical conductive pathways between them" (col. 7, lines 62-64). It is disclosed that the conductive material may preferably comprise silicone rubber (col. 6, lines 38-43). Furthermore, it is noted that the "binder should be capable of providing a soft composition having a Shore A hardness of less than about 40" (col. 6, lines 34-36). It is

also pointed out that a Shore A hardness of greater than 40 is too hard for most applications (col. 1, line 66 – col. 2, line 1).

Regarding **claim 9**, it would have been obvious to one having ordinary skill in the art at the time of invention, to have provided the elastic of Best with a rubber having a hardness of at least A30, in light of the teachings of Oehmke, in order to provide an adhesive having a requisite conformability, moldability, and flexibility (col. 2, lines 21 + of Oehmke).

Regarding **claim 10**, Applicant and Oehmke each disclose a Silicone rubber composition. Applicant notes that these composition are stable at 250 °C. "Products of identical chemical composition can not have mutually exclusive properties. A chemical composition and its properties are inseparable. Therefore, if the prior art teaches the identical chemical structure, the properties applicant discloses and/or claims are necessarily present." In re Spada, 911 F.2d 705, 709, 15 USPQ2d 1655, 1658 (Fed. Cir. 1990).

Regarding **claim 12**, in Oehmke the elastic material is an adhesive silicone rubber layer (col. 6, lines 38-43).

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Best et al. or Best/Weissenstern.

Both Best and Best/Weissenstern each disclose a mounting process.

Both Best and Best/Weissenstern, however, do not disclose the mounting process including a wire bonding process.

At the time the invention was made, it would have been an obvious matter of design choice to a person of ordinary skill in the art to mount the element of either Best or Best/Weissenstern to the substrate using a wire bonding process because Applicant has not disclosed that the mounting process including a wire bonding process provides an advantage, is used for a particular purpose, or solves a stated problem. One of ordinary skill in the art, furthermore, would have expected Applicant's invention to perform equally well with bump mounting process of either Best or Best/Weissenstern because the element is securably and electrically connected to the substrate.

Therefore, it would have been an obvious matter of design choice to modify Best to obtain the invention as specified in claim 13.

Response to Arguments

8. Applicant's arguments, see pages 2-6, filed 5/7/07, with respect to the rejection(s) of claim(s) 7 and 13 under 35 U.S.C. 102(b) as being anticipated by Riemer and the rejection(s) of claim(s) of 9-12 and 14 under 35 U.S.C. 103(a) as being unpatentable over Riemer in view of Oehmke have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection of claims 7, 11, and 14 under 35 U.S.C. 102(b) as being anticipated by Best, a new ground(s) of rejection of claims 9, 10, and 12 under 35 U.S.C. 103(a) as being unpatentable over Best in view of Oehmke, a new ground(s) of rejection of claim 13 under 35 U.S.C. 103(a) as being unpatentable over

Art Unit: 3726

Best, and a new ground(s) of rejection of claims 7 and 9-14 under 35 U.S.C. 103(a) as being unpatentable over Best in view of Weissenstern.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The reference cited on the attached PTO-892 is cited to show the ultrasonic bonding of an element to a substrate.

10. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

11. A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

12. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jermie Cozart whose telephone number is 571-272-4528. The examiner can normally be reached on Monday-Thursday, 7:30 am - 6:00 pm.

Art Unit: 3726

13. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Bryant can be reached on 571-272-4526. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

14. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



JERMIE E. COZART
PRIMARY EXAMINER

May 22, 2007

REMARKS

This Response responds to the Office Action dated January 8, 2007 in which the Examiner rejected claims 7 and 13 under 35 U.S.C. §102(b) and rejected claims 9-12 and 14 under 35 U.S.C. §103.

Applicants respectfully traverse the finality of the Office Action. Applicants respectfully point out that merely incorporating an allowable dependent claim into an independent claim does not introduce a "new" issue that necessitates a rejection. Therefore, Applicants respectfully request the Examiner withdraws the finality of the Office Action.

Claim 7 claims a method of manufacturing electronic parts, comprising the steps of first, providing a holding jig made of an elastic material, wherein at least one surface of the elastic material is adhesive. Next, a substrate on the is mounted holding jig by an adhesive strength of the surface of the elastic material. An element is mounted onto the substrate and the element is electrically connected to the substrate while the substrate is held on the surface of the elastic material. Ultrasonic waves are applied to a bonding portion at which the electric connection is performed while the substrate is held on the surface of the elastic material.

Through the method of the claimed invention a) manufacturing electronic parts, b) providing a holding jig made of an elastic material having at least one surface which is adhesive, c) mounting an element onto a substrate and electrically connecting the element to the substrate while the substrate is held on the surface of the elastic material and d) applying ultrasonic waves to a bonding portion at which the electric connection is performed, as claimed in claim 7, the claimed invention provides a method of manufacturing electronic parts which prevents the generation

OK
to
enter
R

5/22/07